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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,174	11/14/2003	Atsuhiko Sakurai	TI-35272	2911
23494 7590 06/10/2010 TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265				
EXAMINER				
SAINT CYR, LEONARD				
ART UNIT		PAPER NUMBER		
2626				
NOTIFICATION DATE		DELIVERY MODE		
06/10/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com

Office Action Summary

Application No.

10/714,174

Applicant(s)

SAKURAI ET AL.

Examiner

LEONARD SAINT CYR

Art Unit

2626

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 5, 6, 8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 6, 8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/14/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/15/10 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 3, 5, 6, 8, and 10 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that neither Laroche et al., (1999) nor Laroche (300) teach or suggest calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm (Amendment, pages 7 - 9).

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 3, and 5 are rejected under 35 USC 101 as not falling within one of the four statutory categories of invention. While the claims recite a series

of steps to be performed, a statutory process under 35 USC 101 must be tied to another statutory category (such as a manufacture or a machine) or transform underlying subject matter (such as an article or material) to a different state or thing. The steps in those claims can be performed manually without the use of a particular machine. Those claims could be done in a piece of paper, by using digital signal processing (DSP) theory to derive all the values recited in the claims. Thus, claims **1, 3, and 5** do not define a statutory process.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 1, 3, 5, 6, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laroche (Improved Phase Vocoder Time-Scale modification of Audio, IEEE, 1999) in view of Laroche (US Patent 6, 766,300); and further in view Dolson (US Patent 6,112,169).

As per claims 1, and 6, Laroche (1999) discloses a method/apparatus of converting an input digital audio signal into an output digital audio signal having a modified time scale comprising the steps of:

receiving input digital audio data having a first time scale ("time scale...in the audio and speech"; page 323, col.1, paragraph 2)

calculating a discrete Fourier transform of first equally spaced, overlapping time windows having a first overlap amount of the input digital audio signal ("N is the size of

the discrete Fourier transform...correspond to overlapping"; page 324, col.1, section A – col.2, paragraph 1);

partitioning the spectrum into a plurality of contiguous spectral bands ("the windowed short-time signals"; page 324, col.1, section A – col.2, paragraph 1);

identifying a dominant spectral line having the greatest magnitude within each spectral band ("searched local maxima...dominant peak"; page 329, col.1, paragraphs 2, and 3);

calculating a phase difference for the dominant spectral line of each spectral band by a phase vocoder algorithm ("**phase difference**"; page 329, col.1, paragraph 3; page 330, col.1, last 15 lines);

calculating a phase difference for each of a predetermined number of spectral lines near the dominant spectral line within each spectral band as the phase difference of the corresponding dominant spectral line ("**calculate analysis phase difference between peak and current channel, and calculate current synthesis phase using (16)**"; see also the steps of the scaled-phase-locking scheme summary; page 329, col.1, paragraph 3; page 330, col.1, last 15 lines); and

calculating an inverse discrete Fourier transform resulting in equally spaced, overlapping time windows having a second overlap amount employing the calculated phase difference for each spectral line, the second overlap selected having a ratio to the first overlap amount to achieve a desired time scale modification ("**resynthesis stage...obtained by inverse-Fourier-transform...satisfy strong consistency**

conditions...correspond to overlapping short-time signals"; page 324, col.1, section A, paragraph 2 –col.2, paragraph 1);

converting the digital audio signal into an audio signal having a second time scale according to the desired time scale modification ("pitched signals such as speech...performing time-scale modification"; page 331, col.2, paragraph 1).

However, Laroche (1999) does not specifically teach calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm; partitioning the spectrum into a plurality of contiguous spectral bands according to a Bark scale where each spectral band has an extent dependent upon human frequency perception.

Laroche (300) teaches that the duration of the window size and the size of the Fourier transform are usually set to 3 to 5 ms, which gives uniform frequency bands of about 300 Hz; a better sub-band decomposition could be used using frequency bands uniform in a bark scale (col.3, lines 51 - 58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to used bark scale frequency division as taught by Laroche (300) in Laroche (1999), because that would help better divide the spectrum in better uniform frequency bands (col.3, lines 53 – 55).

However, Laroche (1999) in view of Laroche (300) do not specifically teach calculating a phase difference for other spectral lines of each spectral band by the phase vocoder algorithm.

Dolson teaches computing the remaining phase values in each contiguous frequency regions. The phase values are simply shifted by adding or subtracting the same number that was added to or subtracted from the phase value for the significant peak (col.5, lines 50 – 60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to shift the remaining phase values as taught by Dolson in Laroche (1999) in view of Laroche (300), because that would preserve the linear differences among the phases (col.5, lines 57 -60).

As per claims 3, and 8, Laroche (1999) in view of Laroche (300; and further in view of Dolson further disclose merging nearby spectral lines that are within a predetermined frequency range of each other prior to calculating the phase difference ("into a set of contiguous frequency regions, such that each contiguous frequency region includes a single significant peak"; Dolson; col.3, lines 27 – 30).

As per claims 5, and 10, Laroche (1999) in view of Laroche (300; and further in view of Dolson further disclose partitioning the spectrum into a plurality of contiguous spectral bands includes adjusting boundaries of spectral bands to maintain important frequency groups within the same spectral band ("the borders between contiguous frequency regions may be selected in a number of ways. In one embodiment, the channel midway between two significant peaks becomes the border between the corresponding contiguous frequency regions"; Dolson, col.5, lines 20 – 24).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571)272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or (571)-272-1000.

LS

06/04/10

/Leonard Saint-Cyr/

Examiner, Art Unit 2626